SGM PTM&N

Program Book/Guidelines for Eaton Vickers Hydraulic Products

Adapted for APAC Applications

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Document Management Information

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Revision Date	Version No.	Document Name	Revision	Paragraph Affected	Revised By
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1.0 INTRODUCTION

1.1 SCOPE OF DOCUMENT

The Program Book provides a list of Eaton Vickers Hydraulic Products to be used for new SGM PT Programs. The use of components not listed in the Program Book requires a deviation from SGM PT Controls Engineering. For the complete Hydraulic System requirements see SGM PT Specification SP-F-Hydraulics.

1.2 COMPANY OVERVIEW…

Eaton Corporation is a diversified power management company with 2010 sales of $13.7 billion. Celebrating its 100th anniversary in 2011, Eaton is a global technology leader in electrical components and systems for power quality, distribution and control; hydraulics components, systems and services for industrial and mobile equipment; aerospace fuel, hydraulics and pneumatic systems for commercial and military use; and truck and automotive drivetrain and powertrain systems for performance, fuel economy and safety. Eaton has approximately 73,000 employees and sells products to customers in more than 150 countries.

Eaton Corporation is a worldwide leader in the design, manufacture and marketing of a comprehensive line of reliable, high-efficiency hydraulic systems, components and accessories. Eaton's broad range of Hydraulic and Electro-Hydraulic products and high-effiency system solutions continue to be utilized for machine control.

With Global network of distributors and years of experience in the automotive industry combined with wide range of products and system solutions Eaton Corporation provides automotive industry with Products application knowledge, system engineering, Training, Program Management and after Sales Support.

2.0 PRODUCT OVERVIEW

The Eaton Vockers components which are recommended for new SGM Powertrain programs are listed on the following pages. For additional information on Eaton Vickers components please see the Websites listed below.

Eaton : http://eaton.com

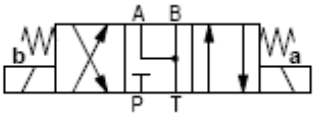
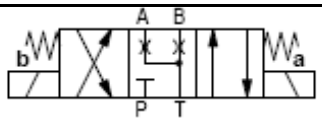
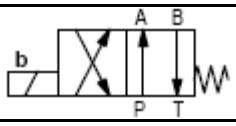
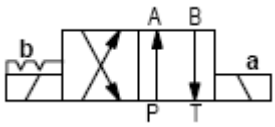
Prodcut Main page : http://hydraulics.eaton.com/products/menu_main.htm

Filters : http://www.internormen.com/cms/en/products/filtertechnology

2.1 DIRECTIONAL VALVES

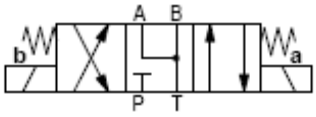
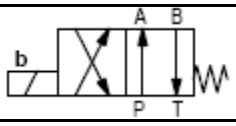
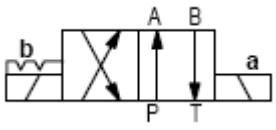
2.1.1 NG6 (D03) Four-Way Directional Control Valves

Subplate mounted, 24 V DC, P=30 watts ,NBR seals, M12 connector on each Sol., pin configuration: Pin 1 & 2 not used, Pin 3 – 0volt, Pin 4 – 24Volt.

Symbol	Model Number & Description	Part Number
	F6-DG4V-3-6C-M-KUPM4L-D7-H7-60 Double Solenoid, 3-Position, A&B to Tank, Pressure Blocked	**02-400431**
	**F6-DG4V-3-33C-M-KUPM4L-D7-H7-60** Double Solenoid, 3-Position, A&B Bleed to Tank, Pressure Blocked	**02-400434**
	F6-DG4V-3-2A-M-KUPM4L-D7-H7-60 Single Solenoid, Spring Return	**02-400425**
 †	F6-DG4V-3-2N-M-KUPM4L-D7-H7-60 Double Solenoid, 2-Position, Detented **Note:** To be used for clamping applications only. Other applications requirewritten approval from SGM PT Controls Eng.	**02-400428**

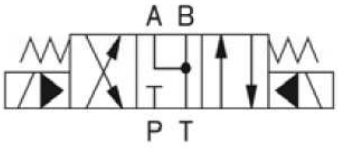
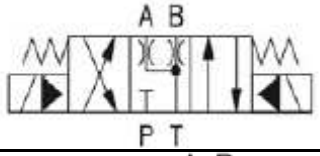
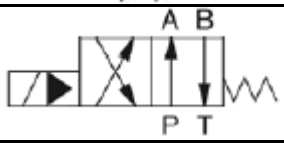
2.1.2 Single Stage NG10 (D05) Four-Way Directional Control Valves

Subplate mounted, 24 V DC, P = 30 Watts, NBR seals, M12 connector on each Sol., pin configuration: Pin 1 & 2 not used, Pin 3 – 0volt, Pin 4 – 24Volt.

Symbol	Model Number & Description	Part Number
	F6-DG4V4-016C-M-KUPM4L-D7-HL-4-10 Double Solenoid, 3-Position, A&B to Tank, Pressure Blocked	**02-400442**
	F6-DG4V4-012A-M-KUPM4L-D7-HL-4-10 **Single Solenoid, Spring Return**	**02-400438**
 †	F6-DG4V4-012N-M-KUPM4L-D7-HL-4-10 Double Solenoid, 2-Position, Detented **Note:** To be used for clamping applications only. Other applications require written approval from SGM PT Controls Eng.	**02-400440**

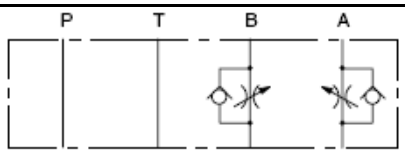
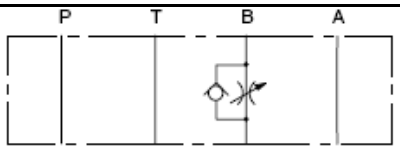
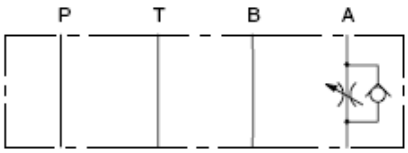
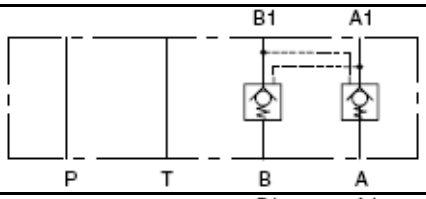
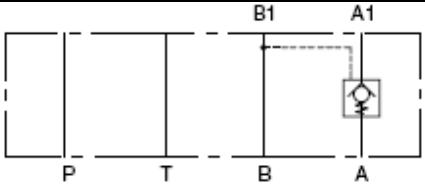
2.1.3 NG16 (D07) Four-Way Directional Control Valves

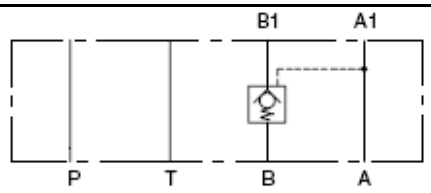
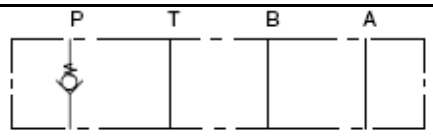
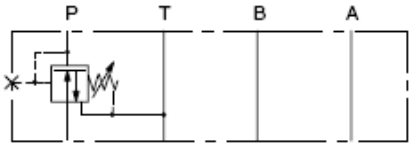
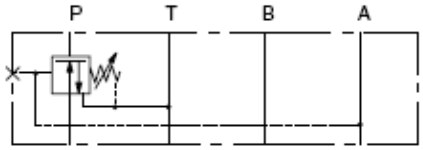
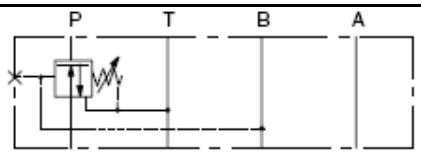
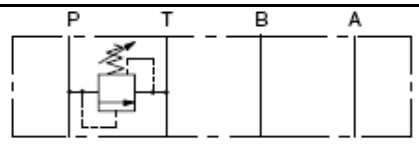
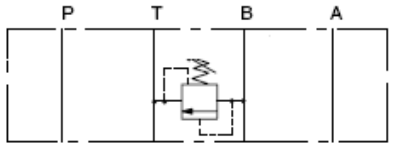
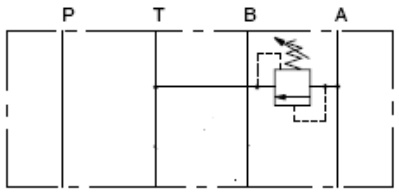
Subplate mounted, 24 V DC, P=18 Watts, NBR seals, M12 connector on each Sol., pin configuration: Pin 1 & 2 not used, Pin 3 – 0volt, Pin 4 – 24Volt.

Symbol	Model Number	Part Number
	F6-DG5V-7-6C-M-KUPM4L-D7-HL7-10 Double Solenoid, 3-Position, A&B to Tank, Pressure Blocked	**02-400451**
	F6-DG5V-7-33C-M-KUPM4L-D7-HL7-10 Double Solenoid, 3-Position, A&B Bleed to Tank, Pressure Blocked	**02-400452**
	F6-DG5V-7-2A-M-KUPM4L-D7-HL7-30 Single Solenoid, Spring Return	**02-400449**

2.2 MODULAR SANDWICH VALVE.

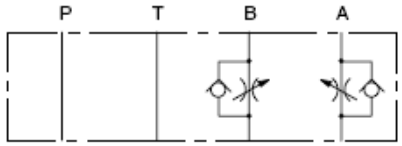
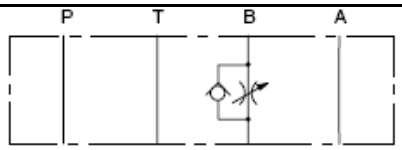
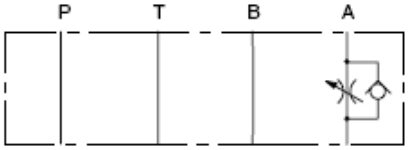
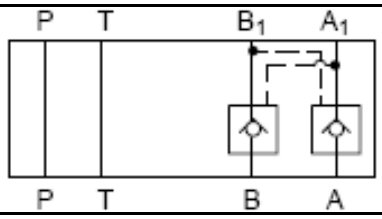
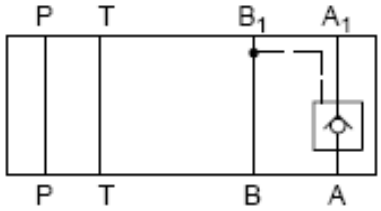
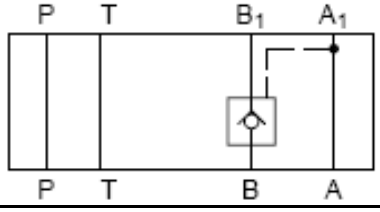
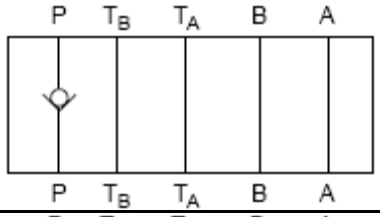
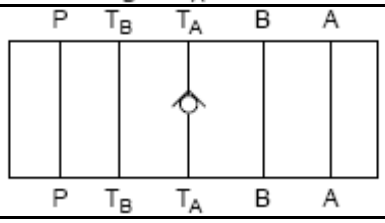
2.2.1 NG6 (D03) Modular Sandwich Modules.

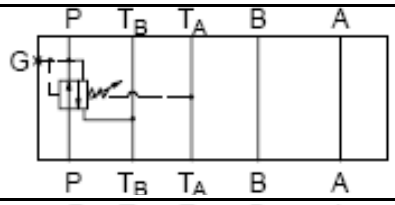
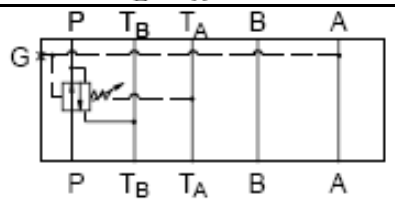
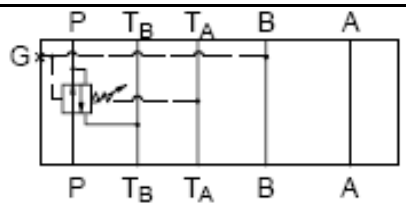
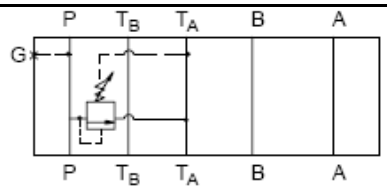
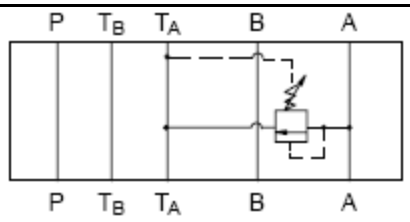
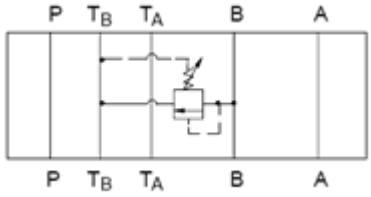
Symbol	Model Number & Description	Part Number
	**Dual Flow control Module** Meter out On port A & B. DGMFN-3-Y-A1W-B1W-41	**694411**
	**Flow control Module** Meter out On port B. DGMFN-3-Y-B1W-41	**02-138526**
	**Flow control Module** Meter out On port A. DGMFN 3 Y A1W 41	**02-138527**
	**Dual P.O. Check Module** On Port A & B Pilot Ratio 3:1 DGMPC 3 ABK BAK 41	**694400**
	**A Port P.O Check Module** On Port A Pilot Ratio 3:1 DGMPC 3 ABK 41	**870024**

	**B Port P.O Check Module** On Port B Pilot Ratio 3:1 DGMPC 3 BAK 41	**870023**
	**"P" Port Check Module** 0.5 bar (8 psi) Spring DGMDC 3 Y PK 41	**694415**
	**"P" Port Pressure Reducing / Releiving Module**	
	30 bar max.DGMX23PPAWB40	**870021**
	80 bar max. DGMX23PPBWB40	**870036**
	120 bar maxDGMX23PPCWB40	**870037**
	**"A" Port Pressure Reducing / Releiving Module**	
	30 bar max. DGMX23PAAWB40	
	80 bar max. DGMX23PABWB40	**870031**
	120 bar maxDGMX23PACWB40	**870032**
	**"B" Port Pressure Reducing / Releiving Module**	
	30 bar max. DGMX23PBAWB40	
	80 bar max. DGMX23PBBWB40	**870047**
	120 bar maxDGMX23PBCWB40	**8700267**
	**P to T Pressure Relief Module**	
	50 bar max DGMC 3 PT AW 41	**02-108132**
	100 bar max DGMC 3 PT BW 41	**02-147590**
	200 bar max DGMC 3 PT CW 41	**870233**
	**B to T Pressure Relief Module**	
	50 bar max DGMC 3 BT AW 41	**871703**
	100 bar max DGMC 3 BT BW 41	**02-108538**
	200 bar max DGMC 3 BT CW 41	**870257**
	**A to T Pressure Relief Module**	
	50 bar max DGMC 3 AT AW 41	**02-138107**
	100 bar max DGMC 3 AT BW 41	**02-138108**
	200 bar max DGMC 3 AT CW 41	**02-139196**

Note: All NG6 modules are 40 MM high.

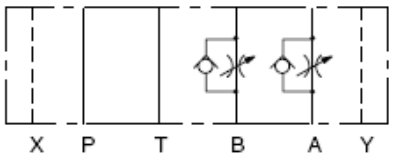
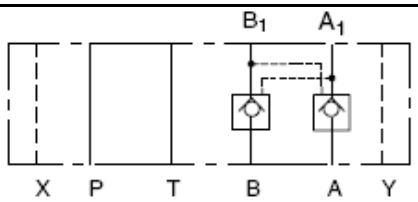
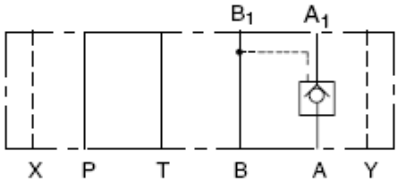
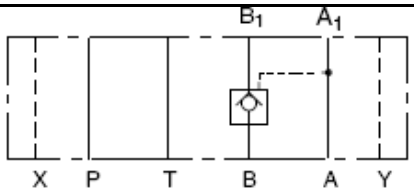
2.2.2 NG10 (D05) Modular Sandwich Modules.

Symbol	Model Number & Description	Part Number
	**Dual Flow control Module** Meter out On port A & B. DGMFN 5 Y A1W B1W 30	**868884**
	**Flow control Module** Meter out On port B. DGMFN 5 Y B1W 30	**02-140612**
	**Flow control Module** Meter out On port A. DGMFN 5 Y A1W 30	**867334**
	**Dual P.O. Check Module** On Port A & B Pilot Ratio 3:1 DGMPC 5 ABK BAK 30	**867364**
	**P.O. Check Module** On Port A Pilot Ratio 3:1 DGMPC 5 ABK 30	**867339**
	**P.O. Check Module** On Port B Pilot Ratio 3:1 DGMPC 5 BAK 30	**867340**
	**“P” Port Check Module** 1bar (15 psi) DGMDC 5 Y PK 30	**867341**
	**“T” Port Check Module** 1bar (15 psi) DGMDC 5 X TK 30	**867342**

	**"P" Port Pressure Reducing / Releiving Module**	
	50 bar max. DGMX2 5 PP AW B 30	**879343**
	100 bar max. DGMX2 5 PP BW B 30	**868314**
	200 bar max. DGMX2 5 PP FW B 30	**880553**
	**"A" Port Pressure Reducing / Releiving Module**	
	50 bar max. DGMX2 5 PA AW B 30	**879344**
	100 bar max. DGMX2 5 PA BW B 30	**868316**
	200 bar max. DGMX2 5 PA FW B 30	**02-101968**
	**"B" Port Pressure Reducing / Releiving Module**	
	50 bar max. DGMX2 5 PB AW B 30	**880554**
	100 bar max. DGMX2 5 PB BW B 30	**868317**
	200 bar max. DGMX2 5 PB FW B 30	**02-145043**
	**P to T Pressure Relief Module**	
	50 bar : DGMC 5 PT AW 30	**879341**
	100 bar : DGMC 5 PT BW 30	**868650**
	200 bar : DGMC 5 PT FW 30	**879342**
	**A to T Pressure Relief Module**	
	50 bar : DGMC 5 AT AW 30	**02-336089**
	100 bar : DGMC 5 AT BW 30	**868651**
	200 bar : DGMC 5 AT FW 30	**02-149394**
	**B to T Pressure Relief Module**	
	50 bar : DGMC 5 BT AW 30	**868651**
	100 bar : DGMC 5 BT BW 30	**868652**
	200 bar : DGMC 5 BT FW 30	**02-127594**

Note: for NG10 Modules height ref individual catalog.

2.2.3 NG16 (D07) Modular Sandwich Modules.

Symbol	Model Number & Description	Part Number
	**Dual Flow control Module** Meter out On port A & B. DGMFN 7 Y A2W B2W 30	**02-413078**
	**Dual P.O. Check Module** On Port A & B DGMPC 7 ABK BAK 30	**02-413103**
	**P.O. Check Module** On Port A DGMPC 7 ABK 30	**02-413102**
	**P.O. Check Module** On Port B DGMPC 7 BAK 30	**02-413106**

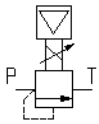
2.3 INLINE CHECK VALVES.

Model Code	Cracking Pressure , Port Size	Flow in lpm	Part Number
DT8P1-02-05-10-UB	0.3 bar (5 psi)cracking, G ¼	12	**796121**
DT8P1-02-30-10-UB	2 bar(30 psi) cracking, G ¼	12	**796125**
DT8P1-03-05-10-UB	0.3 bar (5 psi)cracking, G 3/8	30	**465451**
DT8P1-03-30-10-UB	2 bar(30 psi) cracking, G 3/8	30	**465605**
DT8P1-06-05-11-ENB	0.3 bar (5 psi)cracking, G ¾	76	**796127**
DT8P1-06-30-11-ENB	2 bar(30 psi) cracking, G ¾	76	**796131**
DT8P1-10-05-11-ENB	0.3 bar (5 psi)cracking, G1¼	190	**796133**
DT8P1-10-30-11-ENB	2 bar(30 psi) cracking, G 1¼	190	**796137**

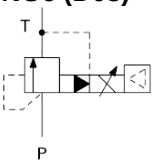
2.4 PROPORTIONAL VALVES

2.4.1 Proportional Pressure Controls

Direct Operated, Max. Flow 5 L/min, with On-Board Electronics (OBE)

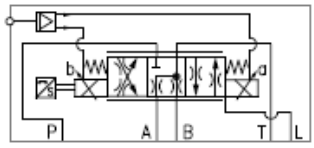
Size	Description	Model Number	Part Number
NG6 (D03) 	100 bar	KBCG-3-100-DZM1-2-A-PE7-H1-10	**02-352464**
	160 bar	KBCG-3-160-DZM1-2-A-PE7-H1-10	**02-352465**
	250 bar	KBCG-3-250-DZM1-2-A-PE7-H1-10	**02-354566**
	Electrical Connector		**934939**

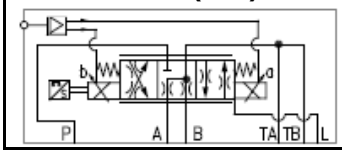
Pilot Operated, Max. Flow 40 L/min, with On-Board Electronics (OBE)

Size	Description	Model Number	Part Number
NG6 (D03) 	100 bar	KBCG5-3-100D-Z-T-M1-4-A-PE7-H1-10	**02-413924**
	160 bar	KBCG5-3-160D-Z-T-M1-4-A-PE7-H1-10	**02-413925**
	250 bar	KBCG5-3-250D-Z-T-M1-4-A-PE7-H1-10	**02-413926**
	Electrical Connector		**934939**

2.4.2 Proportional Directional Valves

Direct Operated with On-Board Electronics (OBE)

Size	Description	Model Number	Part Number
NG6 (D03) 	13L/min	KBFDG4V-3-33C13N-Z-M1-PE7-H7-11	**5995984-001**
	32L/min	CONSULT EATON	
	Electrical Connector		**934939**

Size	Description	Model Number	Part Number
NG610 (D05) 	50L/min	KBFDG4V-5-33C50N-Z-M1-PE7-H7-11	**5996181-001**
	80L/min	CONSULT EATON	
	Electrical Connector		**934939**

2.5 ACCUMULATORS (1 – 32 Liters)

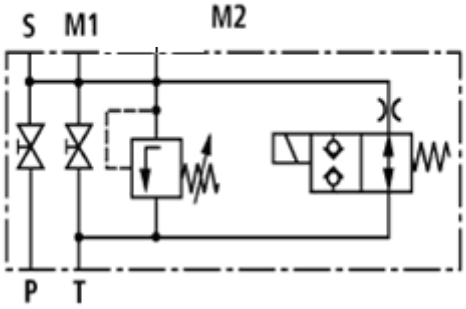
All accumulators shall be according to DIN EN 14359.

Diaphragm – Type Accumulators			
Volume	**Pressure Rating**	**Ports ISO 1179-1 G thread**	**Hydac Model Code**
1 Liter	210 bar	G ½	SB0 210 1 E1 /112 ** 210 AK
Bottom Repairable Bladder Accumulators			
Volume	**Pressure Rating**	**Ports ISO 1179-1 G thread**	**Hydac Model Code**
4 Liter	330 bar	G 1¼	SB 330 4 A1 / 112 ** 330 A
6 Liters	330 bar	G 1¼	SB 330 6 A1 / 112 ** 330 A
10 Liters	330 bar	G 2	SB 330 10 A1 / 112 ** 330 A
20 Liters	330 bar	G 2	SB 330 20 A1 / 112 ** 330 A
32 Liters	330 bar	G 2	SB 330 32 A1 / 112 ** 330 A

Accessories	**Volume**	**Qty**	**Part Number**
Clamp	1 ltr	1	**100AV00048A**
Clamp	4 … 6 ltr	2	**100AV00041A**
Clamp	10 ltr	1	**100AV00042A**
Clamp	20 … 50 ltr	2	**100AV00042A**
Support Bracket w/ Ring	4 … 6 Liters	1	**100AV00054A**
Support Bracket w/ Ring	10…32 Liters	1	**100AV00055A**
Charging kit			**100AV00093A**

**** Note**: The accumulator model codes may require a different suffix code depends upon the country where the accumulator is being shipped. **For China it will be "A9".**

2.6 ACCUMULATOR SAFETY BLOCKS



The Accumulator Safety Blocks are used for safety, isolation and unloading of hydraulic accumulators. SGM PT specifications require a safety block to be provided for each accumulator application. Each safety block is equipped with a manual isolation valve with locking handle, manual unloading valve, safety valve and a 24 V solenoid unloading valve.

Accumulator Size	Size –Model Code	Ports ISO 1179-1 G thread	Part Numbers
1 Liter	**NG 10 – ESS 10E 16Y1-N250A-S30- L**	G 1/2	100AV00169A
4 to 6 Liters	**NG 10 – ESS 10E 16Y1-N250A-S12- L**	G 1¼	100AV00170A
10 to 20 Liters	**NG 20 – ESS 20E16Y1-N250A-S13- L**	G 2	100AV00171A
32 Liters	**NG 32 – ESS 32E16Y1-N250A-S309- L**	G 2	100AV00172A

Accessories Part Number	**Part Number**
DIN-M12 Connector Equipped with Z diode and indicator light (DIN to M12 adapter to be added)	**VAG-029-3401 (MENCOM)**

2.7 SUB PLATES

Steel or Ductile Iron Subplates with Metric Threads for Valve Bolt Down				
Valve Pattern	**Port ISO 228 #**	**Model Code**	**Description**	**Part Numbers**
NG6(D03)	G 3/8	DGVM 3 10 R	Bottom Ported	**466730**
NG10 (D05)	G ½	E DGSM 01Y 10 R	Bottom Ported	**711921**
NG16(D07)	G 3/4	E DGVM 7X D 10 R	Bottom Ported w/ X & Y Ports	**984617**
NG25(D08)	G1	E DGVM 8X D 10 R	Bottom Ported w/ X & Y Ports	**788298**

2.8 MANIFOLDS

Ductile Iron Manifolds with Bottom and Side Ports and Metric Valve Bolt Down Threads			
SIZE	**Ports**	**Nr. Of Stations**	**Model Code**
NG6(D03)	A&B: G ½ P&T : G ¾ A B Test Points G1/4 ISO 228 Ports P & T : Both Ends A& B : Bottom Face Test Points : One on each side	2	PREMIUM - 3 2 LPR BP
		3	PREMIUM - 3 3 LPR BP
		4	PREMIUM - 3 4 LPR BP
		5	PREMIUM - 3 5 LPR BP
		6	PREMIUM - 3 6 LPR BP
		7	PREMIUM - 3 7 LPR BP
NG10 (D05)	A&B: G 1 P : G ¾ T : G 1 A B Test Points G1/4 ISO 228 Ports P & T : Both Ends A& B : Bottom Face Test Points : One on each side	2	MR K - 5 - 2 G
		3	MR K - 5 - 3 G
		4	MR K - 5 - 4 G
		5	MR K - 5 - 5 G
		6	MR K - 5 - 6 G
		4	DD05HPB043B
		5	DD05HPB053B
		6	DD05HPB063B

2.8.1 COVER PLATES

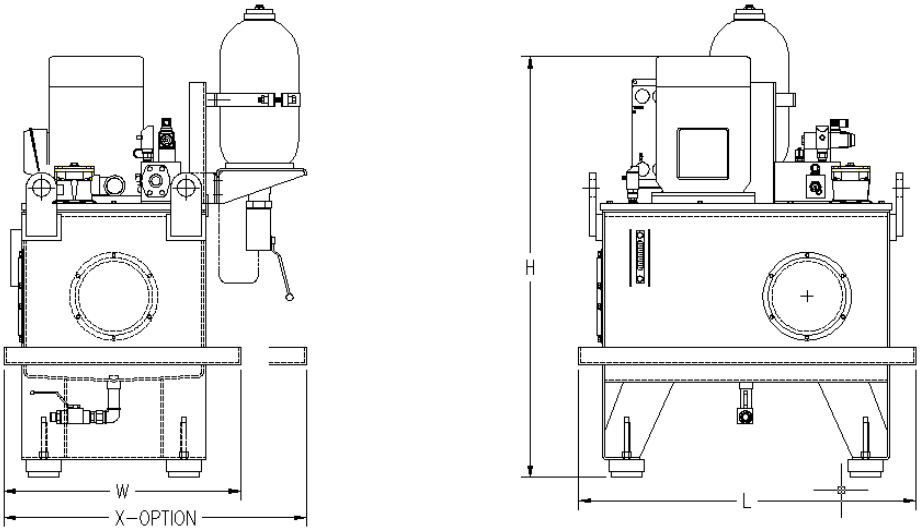
Valve Pattern	Description	Model code
NG6 (D03)	Cover Plate with Metric Bolts & “O” Rings	MR C - 3 PA
NG10 (D05)	Cover Plate with Metric Bolts & “O” Rings	MR C - 5 PA
NG6 (D03) - NG10(D05)	D05(NG10) Adapter with Metric Bolts & “O” Rings	MR A - 5 / 3

2.9 HYDRAULIC POWER UNIT.

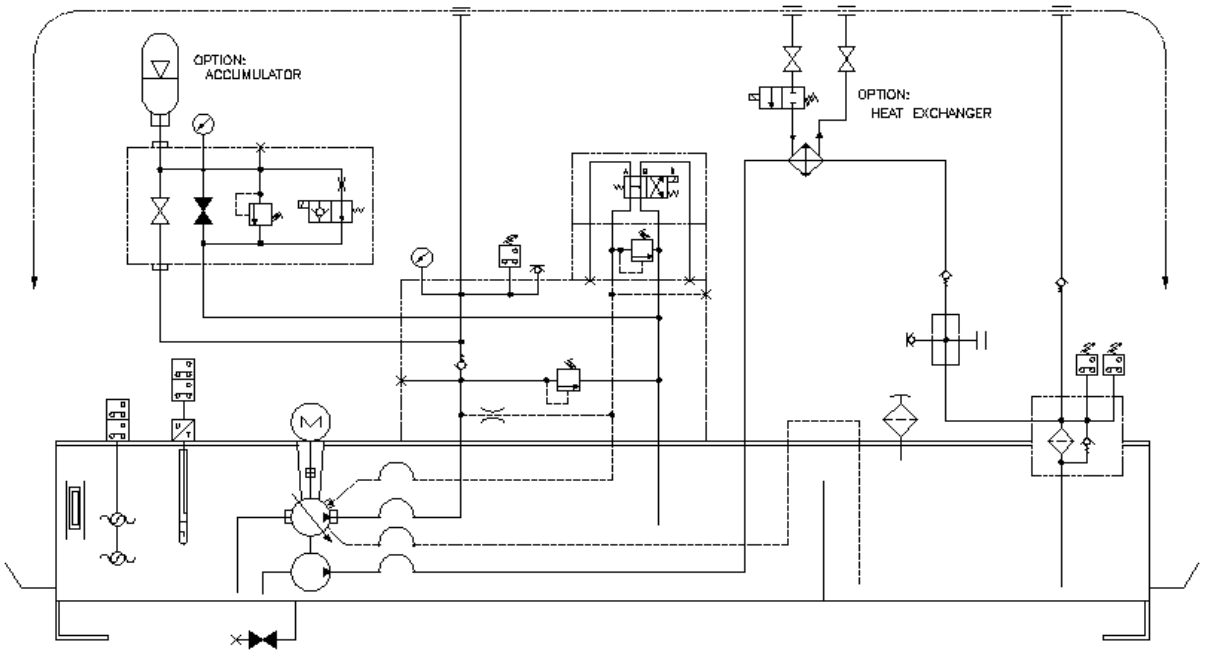
The Vertical power units for G.M. are available in four standard sizes, 100, 250, 400 & 800-Liter reservoirs. The power unit will employ a thru-drive PVM/PVQ variable volume piston pump for main system flow with “V” series fixed displacement vane pump for the Re-circulation / Filtration loop. Should a heat exchanger be required for a specific application, a plate style heat exchanger will be added in the re-circulation line. For GM’s maintenance, purposes the pump case drain line will access through the reservoir removable top plate and then connected to the return side of the reservoir. The clean out covers are fixed with a minimum of six studs to prevent cover leakage. Power units will be supplied with c isolation / level pads. If a heat exchanger is required for an application, a Plate style exchanger will be part of the re- circulation loop. In addition, should an accumulator be required for certain application, it will be added to the power unit along with the required lockable accumulator isolation block.

Power units for special machine applications, such as for long clamping cycles should be equipped with a heat exchanger in the re-circulation line.

SGM Powertrain Vertical Hydraulic Power Units



SIZE	L	W	H
100 LITER	1000 mm	700 mm	1200 mm
250 LITER	1060 mm	850 mm	1450 mm
400 LITER	1400 mm	950 mm	1750 mm
800 LITER	1700 mm	1150 mm	2100 mm



Sound Spec: Less than 75 dB(A)

Ports: ISO 1179-1 (G thread)

Options: Accumulator circuit, heat exchanger circuit

Fill point: H6-63 BSPP

Labels: Per GM Spec.

Tubing & Fittings: Trivalent Chrome metric tubing & metric flareless fittings per GM spec.

Pump Drive Speed

The electric motor drive speed shall be 1500 RPM. The exception is when a slower drive speed is required to achieve the power unit sound level of 75 dB (A). For these applications only, 1000 RPM electric motors will be approved by SGM PT Controls Engineering.

Electric Motor Voltage

The machine builder should confirm the SGM. plant location to determine the exact motor voltage requirements.

	100 L	**250 L**	**400L**	**800 L**
Main Pump, Variable Displacement	PVM018ER17DS05AA C2314000A00A	PVM045ER17DS08AAC23 14000A00A	PVM081ER18FS08AAC231 4000A00A	PVM131ER18HS08AAC2 314000A00A
Theo.Flow @ 1000 RPM	18.0 LPM	45.0 LPM	80.9 LPM	131.0 LPM
Theo. Flow @1500 RPM	27.0 LPM	67.6 LPM	121.4 LPM	196.6 LPM
Aux Pump for Filtering/Cooling Loop	V101S5S11A20	V201S11S62A11	V201S11S62A11	V201S11S62A11
DIN Return Filter	DRT 1 063 BC 4 XX N B C 06 /w VR2LZ. 0 / BO Dual Elec Indicator	DRT 1 160 BE 4 XX N B C 06 /w VR 2 LZ. 0 / BO Dual Elec Indicator	DRT 1 250 BF 4 XX N B C 06 /w VR 2 LZ. 0 / BO Dual Elec Indicator	DRT 1 630 BM 4 XX N B C 06 /w VR 2 LZ. 0 / BO Dual Elec Indicator
Filter Element	VDT 063 B C 06	VDT 160 B C 06	VDT 250 B C 06	VDT 630 B C 06
Return Filter	DIN Filters should be used for all regions except North America. For North America HF4 series return filters should be used.			
Temperature Switch	IFM TR7430	IFM TR7430	IFM TR7430	IFM TR7430
Level Switch	IFM LK7023	IFM LK7023	IFM LK7023	IFM LK7023
Pressure Switch	IFM PN7001	IFM PN7001	IFM PN7001	IFM PN7001

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